THIS INVENTION CLAIMS:

1. A method of manufacturing a fibrous formed product, wherein the fibrous formed product includes a low-density layer coarsely formed mainly by thick fibers interleaved between upper and lower high-density layers closely formed mainly by the thin fibers, comprising:

(a) preparing a mixture of fibers including thick fibers and thin fibers, wherein an average weight of a thin fiber is smaller that an average weight of a thick fiber; and

(b) forming a first and second fibrous mat from the mixed fibers, wherein each fibrous mat comprises a low-density layer coarsely formed mainly by the thick fibers and a high-density layer closely formed mainly by the thin fibers, and wherein each of the fibrous mats are formed by:

(b1) supplying the mixed fibers onto an outer peripheral surface of a roller, wherein the roller is configured so as to temporarily retain the mixed fibers on the outer peripheral surface; and

(b2) rotating the roller so as to rotate the mixed fibers with the roller and releasing the mixed fibers from the roller, so that the mixed fibers are thrown toward a fiber receiving surface by a rotational force of the roller so as to form a fibrous mat on the fiber receiving surface; and

(c) inverting the first fibrous mats; and

(d) overlaying the inverted first fibrous mats with the second fibrous mats such that the low-density layers of each fibrous mat oppose each other; and

(e) joining the overlaid first and second fibrous mats to each other; and

(f) bonding the fibers together.

2. The method as in claim 1, wherein the first and second fibrous mats are formed by utilizing the same roller and the same fiber receiving surface.

3. The method as in claim 1, wherein different rollers form the first and second fibrous mats.

4. The method as in claim 3, wherein the first and second fibrous mats are formed on different fiber receiving surfaces and

wherein the step (c) comprises:

placing the first fibrous mat on a moving surface located below the roller to be used in forming the second fibrous mat such that the low-density layer of the first fibrous mat is positioned at the upper side of the first fibrous mat; and

wherein the low-density layer, of the first fibrous mat placed on the moving surface located below the roller to be used in forming the second fibrous mat, becomes the fiber receiving surface of the second fibrous mat;

wherein the step (d) comprises;

forming the second fibrous mat on top of the first fibrous mat such that the low density layer of the second fibrous mat is formed opposed to the low-density layer of the first fibrous mat.

5. The method as in claim 4, wherein the fiber receiving surface of the first fibrous mat causes the first fibrous mat to move in an opposite direction of the moving surface located below the roller to be used in the forming of the second fibrous mat, and

wherein the fiber receiving surface of the first fibrous mat is positioned above the moving surface located below the roller to be used in the forming of the second fibrous mat, and

wherein the placing of the first fibrous mat of step (c) comprises having the first fibrous mat transfer from an end of the fiber receiving surface of the first fibrous mat and land on the moving surface located below the roller to be used in the forming of the second fibrous mat, such that the low-density layer of the first fibrous mat is positioned at the upper side of the first fibrous mat.

6. The method as in claim 1, wherein the thin fibers comprise inorganic fibers and thermoplastic resin fibers, and the thermoplastic resin fibers serve as agents for bonding the other fibers together.

7. The method as in claim 6, wherein the thermoplastic resin fibers comprise polypropylene fibers.

8. The method as in claim 7, wherein the polypropylene fibers have a diameter range between 15 μm and 17 μm.

9. A method as in claim 6, wherein the inorganic fibers comprise carbon fibers.

10. A method as in claim 9, wherein the carbon fibers have a diameter less than 10μm.

11. A method as in claim 1, wherein the thick fibers comprise sisal hemp fibers.

12. A method as in claim 11, wherein the sisal hemp fibers have a diameter selected between 80 μm and 250 μm.

13. A fibrous formed product comprising:

a low-density layer coarsely formed mainly by thick fibers;

a first and second high-density layers closely formed mainly by the thin fibers, wherein the low-density layer is interleaved between the first and second high density layers; wherein:

the thick fibers have a diameter selected between 80 μm and 250 μm.

14. The fibrous formed product as in claim 13, wherein the thick fibers comprise sisal hemp fibers.

15. The fibrous formed product as in claim 13, wherein the thin fibers comprise inorganic fibers and thermoplastic resin fibers, and the thermoplastic resin fibers serve as agents for bonding the other fibers together.

16. The fibrous formed product as in claim 15, wherein the thermoplastic resin fibers comprise polypropylene fibers.

17. The fibrous formed product as in claim 16, wherein the polypropylene fibers have a diameter selected between 15 μm and 17 μm.

18. The fibrous formed product as in claim 15, wherein the inorganic fibers comprise carbon fibers.

19. The fibrous formed product as in claim 18, wherein the carbon fibers have a diameter less than 10μm.

20. The fibrous mat manufacturing machine, comprising:

a rotary roller having an outer peripheral surface and a fiber retaining device for temporarily retaining fibers on the outer peripheral surface;

a supplier arranged and constructed to supply a mixture of thick fibers and thin fibers onto the outer peripheral surface of the roller; and

a conveyor disposed below the roller and arranged and constructed to receive and convey the fibers that are thrown from the roller as the roller rotates, so that a fibrous mat comprising a high-density layer, formed mainly by the thin fibers, and a low-density layer, formed mainly by the thin fibers, is formed on the conveyor.

21. A machine as in claim 20, wherein the fiber retaining device comprises a plurality of needles extending outward from the outer peripheral surface of the roller.

22. A machine as in claim 21, wherein the fiber retaining device further includes auxiliary rollers that are disposed adjacent the outer peripheral surface of the roller, and each of the auxiliary rollers is spaced apart from the outer peripheral surface of the roller by a predetermined clearance.

23. A machine as in claim 20, wherein the conveyor comprises a conveyor belt that is driven at a constant speed.

24. A fibrous mat manufacturing machine, comprising:

first and second rotary rollers each having an outer peripheral surface and a device for temporarily retaining fibers on the outer peripheral surface; and

first and second suppliers arranged and constructed to supply a mixture of thick fibers and thin fibers onto the respective outer peripheral surfaces of the first roller and the second roller;

a first conveyor disposed below the first roller and arranged and constructed to receive and convey the fibers that are thrown from the first roller as the first roller rotates, so that a first fibrous mat comprising a first high-density layer formed mainly by the thin fibers and a first low-density layer formed mainly by the thick fibers is formed on the first conveyor;

a second conveyor, disposed below the first conveyor and the second roller, to receive and convey the first fibrous mat in an inverted position and to receive the fibers that are thrown from the second roller as the second roller rotates, so that a second fibrous mat comprising a second high-density layer formed mainly by the thin fibers and a second low-density layer formed mainly by the thick fibers is formed on the first fibrous mat such that the first low-density layer of the first fibrous mat opposes the second low-density layer of the second fibrous mat.

25. A machine as in claim 24, wherein the fiber retaining device comprises a plurality of needles extending outward from the outer peripheral surface of the corresponding roller.

26. A machine as in claim 25, wherein the fiber retaining device further includes auxiliary rollers that are disposed adjacent the outer peripheral surface of the corresponding roller, and each of the auxiliary rollers is spaced apart from the outer peripheral surface of the corresponding roller by a predetermined clearance.

27. A machine as in claim 24, wherein each of the first and second conveyors comprises a conveyor belt that is driven at a constant speed.

28. A machine as in claim 27, wherein the first and second conveyors are driven in opposing directions to each other.